

~~Sub. A15~~ What is claimed is:

1. A fuel injection valve for fuel injection valve systems of internal combustion engines, having a valve longitudinal axis (15), having an energizable actuating element (8, 18, 19), having a valve closing element (14) which is axially movable along the valve longitudinal axis (15) and which works in conjunction with a rigid valve seat (13) that is provided on a valve seat element (10) so as to open and close the valve, and having at least one exit opening (9) that is provided downstream from the valve seat (13), the opening movement of the valve closing element (14) being oriented away from the exit opening (9) and the closing movement of the valve closing element (14) being oriented toward the exit opening (9), wherein the valve closing element (14) and the valve seat element (10) are designed so that the opening movement of the valve closing element (14) is fuel-pressure-assisted.
2. The fuel injection valve according to Claim 1, wherein the valve closing element (14) has an inner through-hole (22) through which fuel flows in a direction that is opposite to the opening movement of the valve closing element (14).
3. The fuel injection valve according to Claim 2, wherein the valve seat element (10) is designed so that upstream from the valve seat (13), between the valve closing element (14) and the valve seat element (10), a hollow space (24) is formed, from which the fuel flows toward the valve seat (13), herein having a radial, outward flow component.
4. The fuel injection valve according to Claim 2 or 3, wherein the valve seat element (10) is designed so that upstream from the valve seat (13), between the valve closing element (14) and the valve seat element (10), a hollow space (24) is formed, from which the fuel flows toward the valve seat (13), herein having not only a radial flow component but also an axial flow component in the direction of the opening movement of the valve closing element (14).
5. The fuel injection valve according to one of the preceding claims, wherein the valve closing element (14) is partial-sphere-shaped.

6. The fuel injection valve according to one of the preceding claims, wherein the valve closing element (14) is connected rigidly and in a pressure-tight manner to a needle sleeve (16) through which fuel flows.

7. The fuel injection valve according to Claim 6, wherein the needle sleeve (16) at least partially penetrates and is attached to an inner through-hole (22) of the valve closing element (14).

8. The fuel injection valve according to Claim 6 or 7, wherein at the end opposite the valve closing element (14) the needle sleeve (16) is attached to a valve housing (1, 5) rigidly and in a pressure-tight manner, and the axial movement of the valve closing element (14) is enabled by the fact that a section of the needle sleeve (16) is resilient and elastic.

9. The fuel injection valve according to Claim 8, wherein the resilient, elastic section of the needle sleeve (16) is pleated in a helical manner.

10. The fuel injection valve according to one of the preceding claims, wherein the valve seat element (10) has a middle trough-shaped recess (21) which is adjacent to a truncated-cone-shaped valve seat surface (13) in the direction of flow.

11. The fuel injection valve according to one of Claims 1 to 9, wherein the valve seat element (10) is embodied as a flat seat.

12. The fuel injection valve according to Claim 10 or 11, wherein the valve seat element (10) has no inner flow openings, so that the axial fuel flow path in the direction of the exit opening (9) is embodied exclusively at the outer periphery of the valve seat element (10).

13. The fuel injection valve according to Claim 12, wherein the valve seat element (10) has a non-circular outer contour having at least one flattened part (25) that creates a flow path.

14. The fuel injection valve according to Claim 13, wherein the valve seat element (10) is largely trihedral in shape and has three flattened parts (25).

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